

**Remarks/Arguments**

**A. Status of the Claims**

Claims 22 and 28 are amended, and claims 45-46 are added. Support for these amendments can be found throughout the specification and claims as originally filed. For instance, support for the lower claimed range of 148 to 1500 gmol<sup>-1</sup> for the (α, ω)-diiso(thio)cyanate polysulfide prepolymer can be found by calculating the molecular weight of a diisocyanate polysulfide. In this regard, the molecular weight of a diisocyanate polysulfide is 148 gmol<sup>-1</sup> (*i.e.*, 2 NCO + 2 S), and therefore, the claimed range of 148 to 1500 gmol<sup>-1</sup> is supported by the specification. *See* MPEP § 2163.05 [III] (“In the decision in *In re Wertheim*...the ranges described in the original specification included a range of ‘25%-60%’ and specific examples of ‘36%’ and ‘50%’...a limitation to ‘between 35% and 60%’ did meet the description requirement.”).

Claims 22-24, 28-40, 42-43, and 45-46 are pending.

**B. The Utility, Written Description, and Indefiniteness Rejections are Overcome**

Claims 22-24, 28-40, 42, and 43 are rejected under 35 U.S.C. § 101 for lack of utility. In support of this rejection, the Examiner states:

Component (a) of claim 22, the diiso(thio)cyanate polysulfide prepolymer, cannot exist at the lower end of the claimed molecular weight range. The total of only the two isocyanate groups and two sulfide groups substantially exceeds the minimum molecular weight endpoint. Accordingly, since the prepolymer cannot exist over the full scope of the claimed molecular weight range, the claims encompass inoperative embodiments

Furthermore, the first polysulfide prepolymer of claim 28 is similarly inoperative, because the lower end of the average molecular weight range cannot be obtained even when the values of x and y are 1 or less.

Action at 2. These claims are also rejected under § 112, first and second paragraphs, for lack of written description and indefiniteness for the same reason. *Id.* at 2-3.

Applicant disagrees with these rejections. In view of the fact that claim 22 no longer recites the disputed limitation, the rejection as to claim 22 is moot. The following arguments are directed to dependent claims 28 and 45 which include the disputed language.

### **1. Scope of Disputed Claim Limitations**

As an initial matter, Applicant notes that it is not seeking protection for all molecular weights of prepolymers ranging from 100 to 3000  $\text{gmol}^{-1}$  in claims 28 and 45. For instance, these claims include other limitations that further define the claimed prepolymers. Claim 28, for example, encompasses pre-polymers having the claimed chemical formula, that are polysulfides, and where the x and y integers are selected such that the molecular weight of the prepolymer is within 100 to 3000  $\text{gmol}^{-1}$ . Similarly, the prepolymers in claim 45 encompass ( $\alpha$ ,  $\omega$ )-diiso(thio)cyanate polysulfide prepolymers having a number average molecular weight ranging from 100 to 3000  $\text{gmol}^{-1}$ .

Stated another way, these claims are not generically directed to prepolymers that have molecular weights ranging from 100 to 3000  $\text{gmol}^{-1}$ . Rather, the molecular weight limitations must be read in the context of the entire claim. *See* MPEP § 2163 [II](A) (1) (“For Each Claim, Determine What the Claim as a Whole Covers”).

### **2. Applicant's Response**

When the molecular weights range limitations in claims 28 and 45 are read in the context of the entire claim, it is clear that the claims have utility, are supported by the specification, and are definite. The fact that the claimed molecular weight range of 100 to 3000  $\text{gmol}^{-1}$  may include inoperative prepolymers simply means that the inoperative prepolymers do not fall

within the claimed limitations (see above). Further, the Federal Circuit has repeatedly stated that it is **not** a function of the claims to specifically exclude inoperative subject matter:

Even if some of the claimed combinations were inoperative, the claims are not necessarily invalid. **“It is not a function of the claims to specifically exclude . . . possible inoperative substances . . . .”** Of course, if the number of inoperative combinations becomes significant, and in effect forces one of ordinary skill in the art to experiment unduly in order to practice the claimed invention, the claims might indeed be invalid.

*Atlas Powder Co. v. E. I. Du Pont de Nemours & Co.*, 750 F.2d 1569, 1576-77 (Fed Cir. 1984) (internal quotations and citations omitted) (emphasis added); *see also Envirotech Corp. v. Al. George, Inc.*, 730 F.2d 753, 762 (Fed. Cir. 1984) (“[T]he fact that an invention has only limited utility and is only operable in certain applications is not grounds for finding lack of utility.”).

*i. The rejected claims have utility*

In the context of utility under 35 U.S.C. § 101, the Federal Circuit has stated that “[t]o violate § 101 the claimed [subject matter] must be totally incapable of achieving a useful result.” *Brooktree Corp. v. Advanced Micro Devices, Inc.*, 977 F.2d 1555, 1571 (Fed Cir. 1992). There can be no dispute that the majority of prepolymers in claims 28 and 45 falling within the molecular weight range of 100 to 3000 gmol<sup>-1</sup> are operative. Only a small amount, if any, are inoperative and are not covered by the claims. Therefore, the prepolymers in claims 28 and 45 have utility. MPEP § 2107.01 (“Situations where an invention is found to be ‘inoperative’ and therefore lacking in utility **are rare**, and rejections maintained solely on this ground by a Federal court **even rarer**.”) (emphasis added).

*ii. The rejected claims are supported by the specification*

In the context of written description under 35 U.S.C. § 112, first paragraph, Applicant notes that the disputed claim limitations are present in the specification and claims as originally filed. Therefore, there is a strong presumption that claims 28 and 45 are supported by the

specification. *In re Wertheim*, 541 F.2d 257, 262 (CCPA 1976). The following passage from *Ex parte Agnew* (an unpublished Board Opinion) confirms that claims 28 and 45 meet the written description requirement:

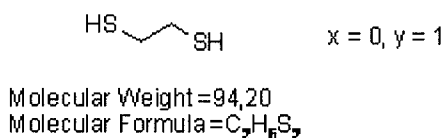
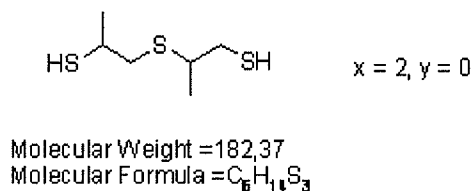
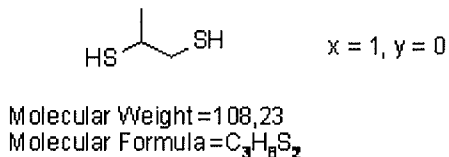
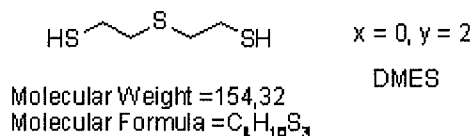
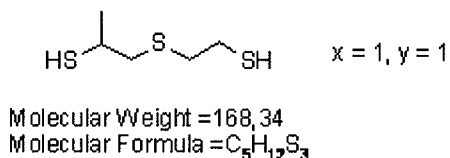
We now consider the rejection of claims 14-30 under 35 U.S.C. § 112 based upon the examiner's position that the disclosure does not contain an adequate written description of the invention and does not enable a person skilled in the art to make and use the claimed invention. This rejection is similar to the rejection on lack of utility because it is premised on the position that there is no disclosure of alignment structure which will permit the invention to operate as intended. Appellants and the examiner have essentially made the same arguments with respect to this rejection as they made with respect to the rejection under 35 U.S.C. § 101.

Although the question of whether the disclosed invention is enabling for optical fibers around 200-250 microns has not been resolved, the evidence of record, as noted above, supports the finding that the invention as disclosed is sufficient to permit the claimed device to work when using lower grade optical fibers such as plastic fibers. Thus, we find that at least one working embodiment of the invention has been properly disclosed. **That is, the invention as claimed reads on at least one embodiment of the invention which is adequately disclosed. Such a disclosure is generally all that is required to meet the requirements of 35 U.S.C. § 112.**

*Ex parte Agnew*, No. 96-3092, at 9-10 (BPAI 1996) (non binding precedent of the Board).

*iii. The rejected claims are definite*

In the context of indefiniteness under 35 U.S.C. § 112, second paragraph, Applicant incorporates the arguments made in the previous response. It must be stressed that "[t]he primary purpose of this requirement of definiteness of claim language is to ensure that the scope of the claims is clear so the public is informed of the boundaries of what constitutes infringement of the patent." MPEP § 2173. There can be no dispute that a person of ordinary skill in the art would be able to identify prepolymers that fall within the ambit of claims 25 and 48 and those that fall outside the ambit of these claims. By way of example, the following compounds fall outside the scope of claim 28 as neither of them are polysulfides:



Claims 28 and 45 provide the notice function of § 112, second paragraph, and are therefore definite. *See* MPEP § 2173.02 (“In reviewing a claim for compliance with 35 U.S.C. 112, second paragraph, the examiner must consider the claim as a whole to determine whether the claim apprises one of ordinary skill in the art of its scope and, therefore, serves the notice function required by 35 U.S.C. 112, second paragraph, by providing clear warning to others as to what constitutes infringement of the patent.”).

As to the Examiner’s “inoperative” argument, Applicant believes that the following statement from *In re Sarett* is instructive:

In any event, the mere possibility of inclusion of inoperative substances does not prevent allowance of broad claims. The board has so held in Ex parte Lilienfeld, 44 USPQ 174, Ex parte Pechukas, 94 USPQ 390, and Ex parte Friedman, 136 USPQ 381, all cited by appellant. If they are so broad as to be vulnerable, no one but the patentee will suffer from it....

**The function of claims is to point out the invention and define the scope of the monopoly, not to exclude substances which are possibly of no use in practicing the invention.**

We do not consider the claims unduly broad and reverse the indefiniteness rejection.

*In re Sarett*, 327 F.2d 1005, 1019 (CCPA 1964) (emphasis added).

### **3. Conclusion**

When the molecular weights range limitations in claims 28 and 45 are read in the context of the entire claim, it is clear that the claims have utility, are supported by the specification, and are definite. The fact that the claimed molecular weight range of 100 to 3000 gmol<sup>-1</sup> may include inoperative prepolymers simply means that the inoperative prepolymers do not fall within the claimed limitations (see above). Further, the Federal Circuit has repeatedly stated that it is **not** a function of the claims to specifically exclude inoperative subject matter.

For at least these reasons, Applicant requests that the rejections under 35 U.S.C. §§ 101 and 112 first and second paragraphs, be withdrawn.

### **C. The Anticipation Rejections Are Overcome**

The Examiner maintains the two previous anticipation rejections for claims 22-24, 28-30, 33-35, 38, and 40-43 in view of WO 01/36507 and WO 01/36508 (the '507 and '508 Publications, respectively). In support of this rejection, the Examiner reasons:

In accordance with

the examiner's previous position, applicants' argued definition of prepolymer allows for the prepolymer to be an oligomer, and it is noted that claim 7 of the references specifically allows for oligomers of the specified thiols, and the position is taken that such oligomers would inherently encompass polysulfides that satisfy applicants' claims. Despite applicants' remarks, applicants have not conclusively established that the disclosed oligomers are not within or encompassed by the argued prepolymers. While applicants' remarks are drawn to those citations of the references that are drawn to the production of disulfide containing compounds, it is noted that the references are by no means limited to compounds containing such disulfide linkages.

For example, the references disclose at page 6 that polythiol reactants may contain sulfide linkages and polysulfide linkages, wherein the number of sulfur atoms may exceed two.

Accordingly, the position is taken that one would immediately envisage from the teachings of the references thiol reactants that satisfy applicants' claimed thiol reactants. The position is further taken that applicants' interpretation of the references is far more limited than the interpretation that would be ascribed to the references by the skilled artisan.

Action at 4-5.

Applicant disagrees. To anticipate the pending claims, the '507 and '508 Publications must disclose an ( $\alpha$ ,  $\omega$ )-diiso(thio)cyanate polysulfide prepolymer that is **free from disulfide (-S-S-) linkages**. See claim 22. These references also must disclose that this ( $\alpha$ ,  $\omega$ )-diiso(thio)cyanate polysulfide prepolymer is prepared, in part, from a ( $\alpha$ ,  $\omega$ )-diol or dithiol polysulfide prepolymer.

With this framework in mind, the following arguments address the Examiner's above reasons for maintaining the rejections.<sup>1,2</sup>

**1. The Examiner Has Not Met His Burden of Showing that the Cited References Disclose Applicant's Claimed Polysulfide Prepolymer Being Free From Disulfide (-S-S-) Linkages**

The '507 and '508 Publications fail to disclose Applicant's claimed polysulfide "prepolymer being free from disulfide (-S-S-) linkage." See claim 22. In fact, the Examiner has not cited to a single oligomer in these references that meets Applicant's claimed polysulfide prepolymer. It is the Examiner, not Applicant, that bears the burden of showing that the cited art

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<sup>1</sup> Applicant also incorporates the arguments and evidence made in the previous responses into this response.

<sup>2</sup> The disclosures in the '507 and '508 Publications are substantially identical with respect to the anticipation rejections. In an effort to be efficient, all of the arguments focus on the '507 Publication. However, all of the arguments made against the '507 Publication equally apply to the '508 Publication.

references disclose a “prepolymer being free from disulfide (-S-S-) linkage.” *In re Sun*, 31 U.S.P.Q.2d 1451, 1453 (Fed. Cir. 1993).

The Examiner’s statement that “one would immediately envisage” the claimed prepolymers are disclosed in the cited references is supported by no evidence. If anything, the Examiner’s statement confirms that he cannot cite to a single oligomer in ‘507 and ‘508 Publications that meets Applicant’s claimed polysulfide prepolymer “being free from disulfide (-S-S-) linkage.” Further, the “at once envisage” standard concerns situations where the claimed compound is not specifically named in the reference, but instead it is necessary to select various substituents from a list of alternatives given for placement at specific sites on a generic chemical formula disclosed in the reference. MPEP § 2131.02. Only then, can anticipation be found “if the classes of substituents are sufficiently limited or well delineated.” *Id.* In the present case, however, Applicant’s claimed polysulfide “prepolymer being free from disulfide (-S-S-) linkage” is simply not disclosed in the ‘507 and ‘508 Publications either by a generic formula, or by selection of various substituents to add to a generic formula. Therefore, the anticipation rejection must be withdrawn. *Id.*

**2. The Examiner Improperly Picks and Chooses From Different Portions of the Cited Art in an Attempt to Support the Anticipation Rejection**

Although the ‘507 Publication at page 6, lines 5-6 discloses the use of a “polythiol **monomer**” that can include polysulfide linkages, it does not disclose using a prepolymer that contains polysulfide groups. Stated another way, the section relied upon by the Examiner concerns polythiol monomers and not oligomers (or prepolymers) of such monomers.

In an effort to supplement this deficiency, the Examiner improperly relies on a different section of the ‘507 Publication and combines it with the monomers disclosed at page 6, lines 5-6. That is, the Examiner imports the use of the term “oligomer” in claim 7 at page 34 of the cited



reference to page 6, lines 5-6, of this reference. This type of picking and choosing between different sections of the cited reference is improper. *In re Arkley*, 455 F.2d 586, 587 (CCPA 1972) (holding that an anticipating reference “must clearly and unequivocally disclose the claimed compound or direct those skilled in the art to the compound without any need for **picking, choosing, and combining** various disclosures not directly related to each other by the teachings of the cited reference.”); *see also Akzo N.V. v. U.S. International Trade Commission*, 808 F.2d 1471, 1480 (Fed. Cir. 1986) (stating that “...in effect that the anticipatory reference must disclose in the prior art a thing substantially identical with the claimed invention.”).

**3. Even If the Term “Oligomer” Was Used at Page 6, the Resulting Oligomers Necessary Have Disulfide Linkages**

Assuming for the sake of argument that “oligomer” was used at page 6 of the ‘507 Publication, any oligomers resulting from the polymerization of the listed polythiol monomers at page 6 would necessarily have disulfide linkages. This is confirmed throughout the cited reference as follows:

- The ‘507 Publication explains that oligomers of polythiol monomers are formed by oxidative coupling of thiols groups. *Id.* at 7, lines 31-37, to 8, line 9. This results in the formation of disulfide linkages. *Id.* at 7, lines 32-34 (“Such an oxidative coupling can result in the formation of oligomeric polythiol species having disulfide linkages, *i.e.*, -S-S- linkages.”).
- When discussing polythiol monomers that can be used to prepare a polycyanate reactant product, the ‘507 Publication characterizes the resulting polythiol oligomer as having disulfide linkages:

The polythiol monomer used to prepare the polycyanate reactant may be a polythiol oligomer having disulfide linkages, which is prepared from the reaction of a polythiol monomer having at least two thiol groups and sulfur in the presence of a basic catalyst.

By comparison, Applicant’s claimed ( $\alpha$ ,  $\omega$ )-diiso(thio)cyanate polysulfide prepolymer is “free from disulfide (-S-S-) linkage.”

**4. Conclusion Regarding the Anticipation Rejections**

The '507 and '508 Publications explain in their respective disclosures that polymerization of polythiol monomers necessary results in oligomers having at least one disulfide linkage. The disulfide linkage is the result of oxidative coupling of thiol groups between the monomers.

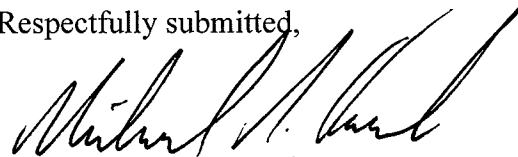
The presence of the disulfide linkage in the '507 and '508 Publication oligomers is in contrast to Applicant's claimed " $(\alpha, \omega)$ -diiso(thio)cyanate polysulfide prepolymer is "free from disulfide (-S-S-) linkage." Therefore, the cited references fail to disclose every element of the claimed invention, and the anticipation rejection should be withdrawn.

**D. Conclusion**

Applicant believes that the present document is a full and complete response to the Office Action mailed May 2, 2007. The present case is in condition for allowance and such favorable action is requested.

The Examiner is invited to contact the undersigned Attorney at (512) 536-3020 with any questions, comments or suggestions relating to the referenced patent application.

Respectfully submitted,



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